

## System calculation

### 08 Hypoid Rear Axle Gearbox

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Description	KISSsoft example
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Non commercial version for demo and support purposes only ! (914)  
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## 1 Messages

 Calculation is consistent.

## 2 Model Overview

### 2.1 Kinematics

Boundary condition	Element	Torque (Nm)	Speed (1/min)	Power (kW)
Input	cin	220.0000	5500.0000	126.7109
OutputR	coutR	397.6923	-1521.2766	-63.3555
OutputL	coutL	397.6923	-1521.2766	-63.3555

### 2.2 Coupling constraint

Connection	Element	Torque ratio	Speed ratio	Power ratio
connection1	coutR (/ coutL )		1.0000	

### 2.3 Ratio

Calculation	Element	Torque (Nm)	Speed (1/min)	Speed ratio
z1z2	z1 (/ z2 )	-220.0000	5500.0000	-3.6154
diff_R	PlanetGear (/ SideGear_R )	137.6627	-0.0000	-1.4444
diff_L	PlanetGear (/ SideGear_L )	-137.6627	-0.0000	-1.4444

## 3 Strength results

### 3.1 Results Gears

Calculation	Element	SF	SH	SFF	SSint	SB	SA
z1z2	z1	1.135	0.960				
z1z2	z2	1.128	0.998				
z1z2	z1 - z2					1.043	
diff_R	PlanetGear	1.921	0.806				
diff_R	SideGear_R	2.785	0.806				
diff_R	PlanetGear - SideGear_R						
diff_L	PlanetGear	2.184	0.859				
diff_L	SideGear_L	3.409	0.859				
diff_L	PlanetGear - SideGear_L						

## 3.2 Results Bearings

Calculation, shaft	Element	S0	Lnh (h)	Lnmh (h)	Lnrh (h)	Lnmrh (h)	D (%)= 5000 h
input -> s1	b1 (SKF 31307)	29.4 2	142090		642497		0.8 ↔ Lnrh
input -> s1	b3 (SKF 21309 E)	12.6 4	15034		38637		12.9 ↔ Lnrh
input -> s1	b2 (SKF 31307)	10.3 5	2089		9769		51.2 ↔ Lnrh
axle -> sc	b4 (SKF 32008 X)	24.9 3	363917		332033		1.5 ↔ Lnrh
axle -> sc	b5 (SKF 32008 X)	6.16	3372		8400		59.5 ↔ Lnrh

S0 < 1 and Lh < Lreq → shown in red..

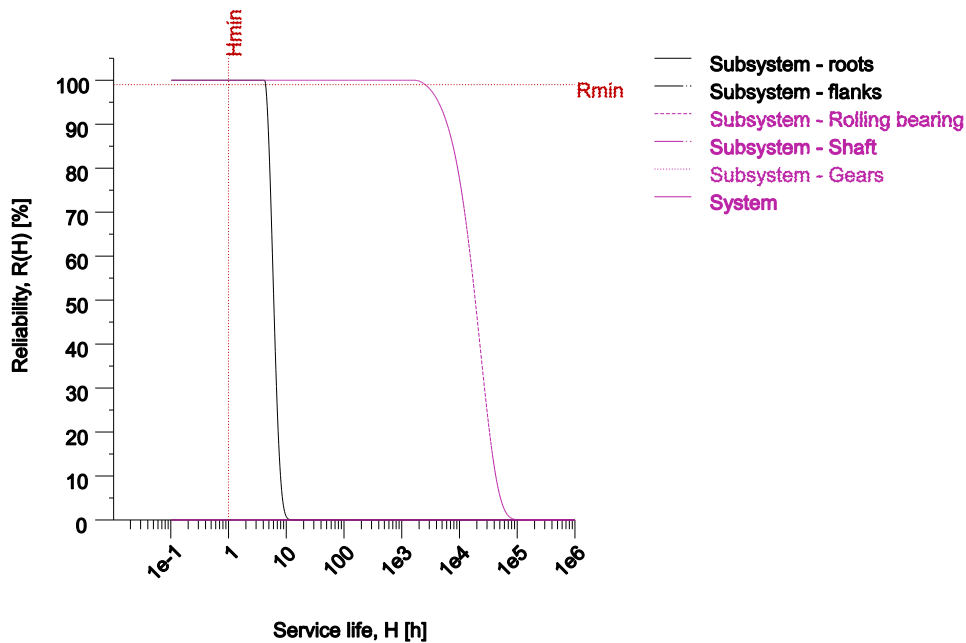
SKF → results provided by SKF cloud.

SKF(LnGM) → SKF generalized rating life model (GBLM) for hybrid bearing

TMK → internal geometry data provided by TIMKEN Online services.

Other bearing results are listed in additional reports in the "Report" section.

## 3.3 Reliability



Calculation of reliability according to Bertsche

Required reliability: 99 %

Required service life: 5000 h

Reliability curves 99.0 % : Service life system 0 h

Rolling bearing

Reliability curves 99.0 % : Service life subsystem 2556 h

planet: There are no rolling bearings defined in the model.

Shafts

input: At least one cross section must be specified so that the reliability can be calculated.  
 axle: At least one cross section must be specified so that the reliability can be calculated.  
 planet: At least one cross section must be specified so that the reliability can be calculated.

Gears  
 Reliability curves 99.0 % : Service life subsystem 0 h

Figure: Reliability curves

## 4 Auxillary Results

### 4.1 Systemspiel und Systemtorsion

Bezugsrandbedingung	Randbedingung	Max (°)	Min (°)	Torsion (°)
Input	OutputR	0.001	0.001	-0.043
	OutputL	0.001	0.001	-0.043
OutputR	Input	0.007	0.007	0.154
	OutputL	0.000	0.000	-0.000
OutputL	Input	0.007	0.007	0.154
	OutputR	0.000	0.000	0.000

### 4.2 Systemträgheitsmomente

Bezugsrandbedingung	Zahnräder	Wellen	Lager	Andere	Total
Input (kg*mm <sup>2</sup> )	233.502	1194.942	929.236	0.000	2357.680
OutputR (kg*mm <sup>2</sup> )	3052.104	15619.097	12146.050	0.000	30817.251
OutputL (kg*mm <sup>2</sup> )	3052.104	15619.097	12146.050	0.000	30817.251

### 4.3 Weitere Daten

	Zahnräder	Wellen	Lager	Andere	Total
Mass (kg)	2.845	6.607	1.777	0.000	11.229
Kinetische Energie (J)	38.730	198.198	154.127	0.000	391.055

## 5 Further information

More reports about power flows, gears, bearings and shafts are available under "Report".

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